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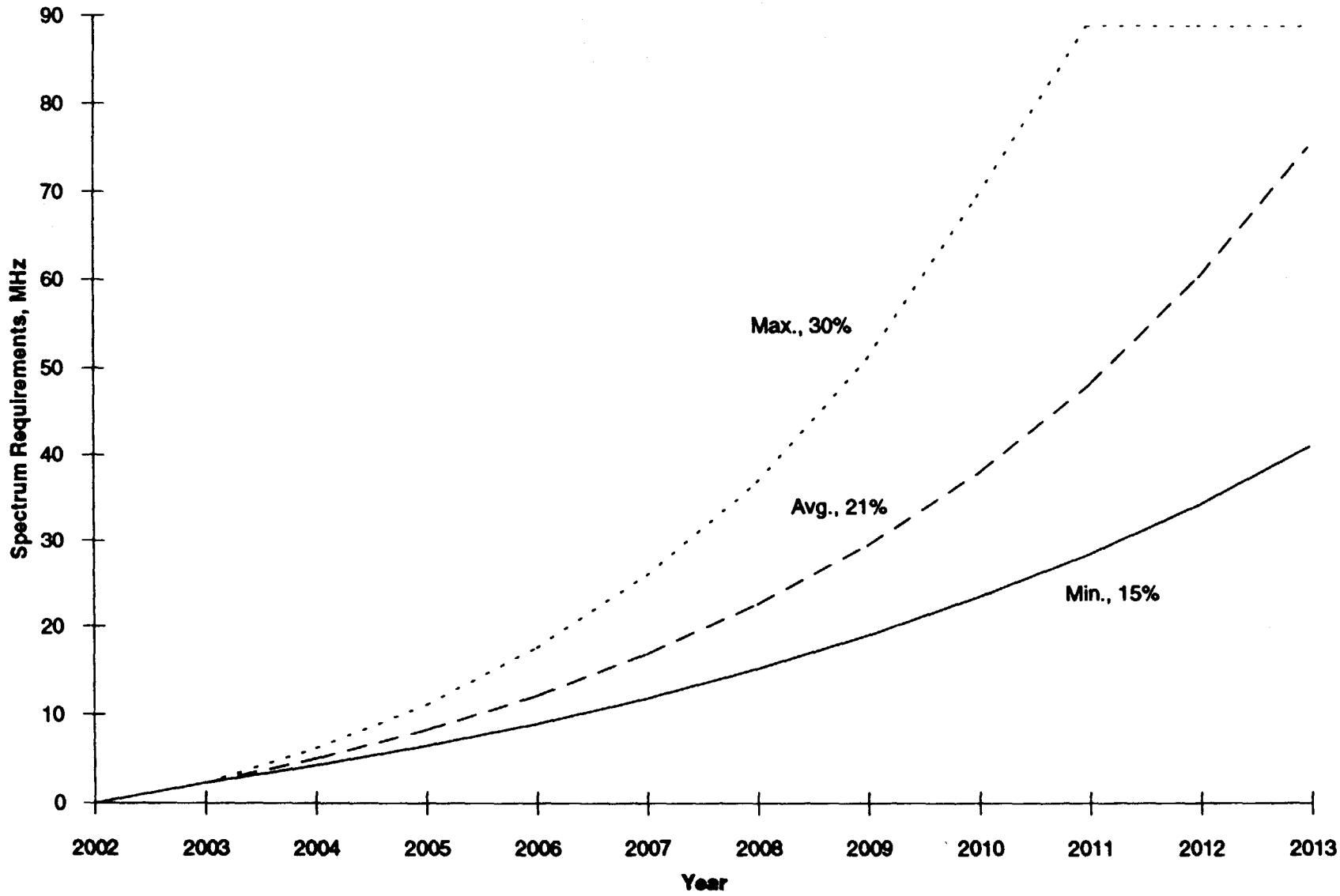
ATTACHMENT 1

Projected growth in CONUS Spectrum Requirements for Iridium type Communications
2 GHz Band (assuming 10.5 MHz available at L Band)



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ATTACHMENT 2

DUPLICATE

RECEIVED

JUN 16 1993

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of:	)	
	)	ET Docket No. 93-59
Amendment of Section 2.106	)	RM No. 8092
of the Commission' Rules	)	
to Allocate Spectrum for Wind	)	
Profiler Radar Systems	)	

COMMENTS OF MOTOROLA, INC.

Motorola, Inc. ("Motorola") herewith submits its comments in the above-captioned proceeding concerning the allocation of radio spectrum for wind profiler radar systems. In particular, Motorola is concerned that the operation of wind profilers in frequency bands immediately adjacent to UHF land mobile stations poses significant interference concerns. The FCC, in cooperation with the NTIA and other affected industry parties, should develop operational and installation standards for wind profilers that would lessen their interference potential to all adjacent services.

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I. INTRODUCTION

In this proceeding, the Commission has proposed to allocate spectrum at 449 MHz for wind profiler radar systems and has also initiated an inquiry on the need for allocating additional spectrum at 915 MHz.[1] Wind profilers are sensitive Doppler radars that measure wind speed and direction and are increasingly used in atmospheric and meteorological applications. Several experimental stations have already been licensed to governmental entities to operate at 404 MHz but the National Telecommunications and Information Agency ("NTIA") now recommends that both government and non-government wind profilers should be assigned frequencies in the band 448 - 450 MHz. Finally, in response to a petition for rule

concludes that wind profilers need only be physically separated by 1.2 miles from a land mobile receiver operating at 451 MHz in order to avoid causing interference.[2] Coupled with the assertion that wind profilers will likely be installed in rural areas, the Commission apparently believes that this relatively small interference zone mitigates against the adoption of specific standards to protect private land mobile stations.

II. COMMENTS

Motorola's preliminary analysis demonstrates that the NTIA underestimates the interference area created by wind profilers with respect to mobile operations in the 451 MHz range. In addition, there is little guarantee that these devices will not be located in areas of heavy land mobile use. For example, an NTIA report shows the planned locations of several government wind profilers and some of these are very close to populous urban areas such as Chicago, Illinois.[3] Further, it would appear that airports would be ideal locations to install wind profilers in order to monitor changing weather conditions. Airports, however, have an extreme concentration of private land mobile stations and even an interference zone of 1.2 miles would threaten a potential multitude of UHF operations. For these reasons,

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[2] EMC Analysis Between Type A Wind Profilers and Remote Pickup Broadcast Stations ("Enclosure 2") at page 7. This NTIA analysis is contained in the docket file of this proceeding.

[3] Assessment of Bands for Wind Profiler Accommodation NTIA Report 91-280, page 3-5.

Motorola strongly suggests that the FCC and the NTIA cooperate with affected industry parties to craft operational requirements for wind profilers that lessen their true interference potential to private land mobile operations.

In its electromagnetic compatibility study between wind profilers and broadcast auxiliary stations operating at 450 MHz, the NTIA supplied the following parameters for typical wind profilers:

Peak Transmitter Power	+72 dBm
Sideband Rolloff at ± 2 MHz	- 45 dB
Antenna Gain	+32 dBi
Off Axis Gain at 90°	- 25 dB

When measuring the amount of interfering signal likely to be received, it is critical to account for the bandwidth of the subject communications receiver. In Enclosure 2, the NTIA provided a plot of the emission spectra of typical wind profiler transmissions that shows that such signals are attenuated by 45 dB at frequencies 2 MHz from the carrier. Plots of emission spectra are typically made using spectrum analyzers over a 300 Hz bandwidth. However, UHF land mobile

compute the necessary separation between a land mobile receiver and a wind profiler transmitting 100 watts ERP. Relying on Hata's representation of the Okumura propagation prediction curves, we have calculated the following required separations as a function of the height of the radar transmitter.

Radar Height (ft)	Required Separation (mi)
5.0	8.6
7.5	10.6
10.0	12.3
12.5	13.6
15.0	14.8

These values differ considerably from the fixed separation of 1.2 miles proposed by the NTIA. Part of the apparent discrepancy could lie in the fact that the NTIA did not account for different heights above ground of the radar transmitter or the operating bandwidths of land mobile receivers. In any event, it is clear that high powered wind profilers operating at 449 MHz offer the potential to interfere with land mobile operations at 451 MHz at far greater levels than that suggested by the NTIA.

Motorola's concern with the interference potential of these devices does not necessarily mean that it is opposed to the Commission's proposed allocation. Indeed, wind profilers provide valuable data for a variety of applications and their use should be accommodated in the spectrum. Motorola believes, however, that operational and installation standards should be prescribed by the Commission in order to lessen the interference potential. In particular, it will be necessary to reduce the amount of energy transmitted through the side lobes along the ground.

Solutions range from improved antenna performance to locating the radar in an earthen berm or other energy absorbing structure. Motorola recommends that the FCC and the NTIA discuss such changes with the manufacturers of wind profilers and the mobile communications industry to determine what methods are most useful.

III. CONCLUSION

Motorola supports the Commission's proposals to make spectrum available for wind profiler radars but suggests that the Commission display more sensitivity to protecting critical land mobile operations at 451 MHz. Standards should be adopted that reduce the amount of energy that wind profilers transmit along the surface of the earth in order to lessen their interference potential.

MOTOROLA, INC